# WiFi-500 Sensor Series

Wireless Data Logging Sensors

# User's Guide

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MEASUREMENT COMPUTING™

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# Table of Contents

# About this User's Guide

## What you will learn from this user's guide

This user's guide describes the device setup and configuration, data file conversion and export, and device control features included with Measurement Computing WiFi-500 Sensor Series wireless data loggers.

## Conventions in this user's guide

**For more information**

Text presented in a box signifies additional information and helpful hints related to the subject matter you are reading.

**Caution!** Shaded caution statements present information to help you avoid injuring yourself and others, damaging your hardware, or losing your data.

**bold** text — **Bold** text is used for the names of objects on a screen, such as buttons, text boxes, and check boxes.

*italic* text — *Italic* text is used for the names of manuals and help topic titles, and to emphasize a word or phrase.

## Where to find more information

Additional information about WiFi-500 Sensor Series wireless data loggers is available on our website at www.mccdaq.com. You can also contact Measurement Computing Corporation by phone, fax, or email with specific questions.

- Knowledgebase: kb.mccdaq.com
- Phone: 508-946-5100 and follow the instructions for reaching Tech Support
- Fax: 508-946-9500 to the attention of Tech Support
- Email: techsupport@mccdaq.com

# Introducing the WiFi-500 Sensor Series Wireless Data Loggers

Thank you for purchasing a WiFi-500 Sensor Series wireless data logger from Measurement Computing. This user's guide explains how to perform the following tasks:

- set up a WiFi-500 Sensor Series wireless data logger to connect to a wireless network
- configure a device to log environmental data and transmit it wirelessly to a host PC or web-based Cloud account
- export logged data to a comma-delimited text file and to a Microsoft® Excel® spreadsheet
- view readings and indicators on a WiFi-500 Sensor Series data logger

## System requirements and recommendations

- WiFi-enabled PC or laptop running Windows® 8/7/ Vista®/XP, 32- and 64-bit
- 802.11b-compliant router or access point running one of the following supported security protocols:
  - WEP 64 bit (Passkey encryption only)
  - WEP 128 bit (Passkey encryption only)
  - WPA-PSK
  - WPA2-PSK
- Micro-USB cable (shipped with sensor)
- Microsoft mouse or compatible pointing device
- Microsoft Excel® 2000 or greater (optional)

### Requirements for Cloud storage

A FilesThruTheAir™ Cloud account is required for Cloud-based data storage. A link is available in the WiFi Sensor Software to create an account.

Your WiFi-500 Sensor Series device may also require a firmware update in order to access the Cloud. Refer to Updating firmware on page 37 for instructions.

## WiFi Sensor Software/Cloud features

The WiFi Sensor Software can set up a device data storage and device configuration using locally on a PC, or remotely using a Cloud account and any device that supports a web browser – smart phone, tablet, laptop, or desktop computers.

- WiFi-500 Sensor Series device is accessible from any location – local or remote – within range of the connected WiFi network or from the Cloud
- Password-protected access using SSL sessions for security
- Local and remote device configuration of the following settings:
  - Device name
  - Temperature scale
  - Sample rate
  - Transmission period
  - Alarms, including alarm hold and alarm delay settings
  - Record on-site checks of devices
- Data export and graph printing

The Cloud interface also offers instant email alerts to as many as 100 addresses for alarms, AC power outage, low battery charge, loss of network connection, and other device-specific problems.

Cloud accounts are web-based and can be accessed at https://www.wifisensorcloud.com/ using a browser on a phone, tablet, PC, or Mac®.

The following optional Cloud services are also available (depends on level of Cloud account being used -- Free, Personal, or Professional).

- Audit trail export to provide a documentary record of changes
- Multiple user access
- Individual time zones per user
- Graphical and tabular data displays with date/time references
- Unlimited data storage (Personal and Professional accounts only)
- Printing a graph (Personal and Professional accounts only)
- Unlimited devices (Professional accounts only)

Refer to www.wifisensorcloud.com/accountdifferences.aspx for a comparison of Free, Personal, and Professional Cloud account features

# Setting Up a Device

To set up a WiFi-500 Sensor Series wireless device for use on either the PC or the Cloud, make sure you have the following items:

- Micro-USB cable
- 802.11b-compliant router or access point
- WiFi-enabled computer with WiFi Sensor Software installed

The computer running the WiFi Sensor Software must be connected to the router either wirelessly or by Ethernet cable.

## Connecting the device to a network

Complete the following steps to connect a WiFi-500 Sensor Series data logger to a WiFi network:

1. Find the password for the router (often located on the bottom of the router).
2. Double-click the WiFi Sensor Software desktop icon ( ) to run the software.
3. Click either **Set-Up Device»On This PC** or **Set-Up Device»On The Cloud** in the main software screen.

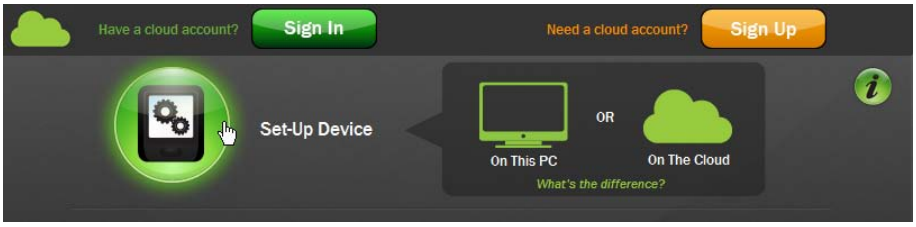



Figure 1: WiFi Sensor Software Set-Up Device options

4. Remove the rubber plug that protects the USB connector on the sensor and connect the sensor to the computer using the Micro-USB cable.

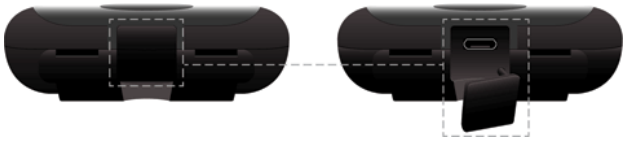


Figure 2: Removing rubber plug over USB connector

Allow any security access highlighted by your firewall or antivirus program if you are prompted.

A **CONNECTED** message indicates the WiFi Sensor Software has detected the device.

If a **NOT CONNECTED** message displays, reconnect the USB cable and the software automatically attempts to detect the device.

5. Once a list of available WiFi networks displays, click on a network to connect to the device. This must be the same network that is connected to the host computer. If a **FAILED** message displays, click **Refresh Connections** until a list of networks displays.
6. Enter the network password and click **CONNECT**.

**Problems connecting?**

If a **NOT CONNECTED** dialog box displays, refer to Cannot connect device to WiFi network on page 38

**Advanced Network Options**

To enter additional network settings, select the **Enter Advanced Network Options Next** checkbox and enter the IP address, subnet mask and default gateway. You can also lock the device so that it only connects to one wireless access point. This may be necessary if you have multiple access points with the same SSID. Enter the MAC address of the access point.

## Logging sessions explained

To manage data received from your device efficiently, both the WiFi Sensor Software and the Cloud divides data up into *sessions*. A device begins a session when it starts logging. If you make any changes to the device such as a sample rate or alarm level change, the software or Cloud closes and saves the current session, and a new session is created.

All sessions are marked with a date and time to show the period that they cover, together with an audit trail showing the changes which caused a new session to start.

Once you successfully connect the device to the WiFi network, proceed to one of the following sections:

- If you selected **Set-Up Device»On This PC**, proceed to Storing Device Data on the PC on page 10.
- If you selected **Set-Up Device»On The Cloud**, proceed to Storing Device Data on the Cloud on page 19.

# Storing Device Data on the PC

When you select **View Devices»On This PC** and connect a device to a WiFi network, the **GENERAL SETTINGS** dialog box displays with general device and logging settings for the a WiFi-500 Sensor Series data logger

## Changing device logging settings

Complete the following steps to change device logging settings from the PC:

1. Enter the following information In the **GENERAL SETTINGS** dialog box:
   - **Name Device to give it a unique identity**: Enter a unique name to identify the device on the WiFi network.
   - **Select temperature scale:** Click **°C** or **°F**.
   - **Select sample rate:** Select a sample rate between **10 Seconds** and **12 Hours** from the drop-down list. This value sets how often the device takes a reading.
   - **Select how often the device will communicate with the PC:** Select how frequently – between every **1 Minute** to every **24 hours** – the device transmits samples to the host computer

   For example, if the sample rate is set to **10 Seconds** and the sample transmission frequency is set to **1 Minute**, the device transmits six samples to the computer every minute (60 seconds ÷ 10 seconds = 6 samples).

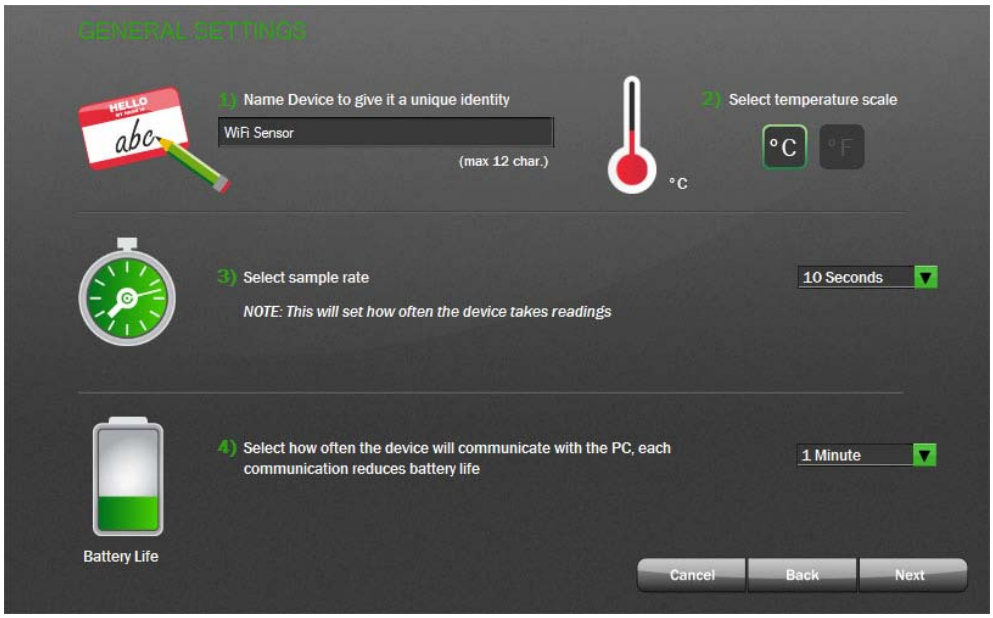



Figure 3: GENERAL SETTINGS dialog box

   The more frequently data is transmitted the quicker battery power is depleted. By increasing the time between transmissions, the battery charge lasts longer.

2. Click **Next**.

## Configuring alarms

In the **TEMPERATURE ALARMS** and **HUMIDITY ALARMS** dialog boxes, you configure the following alarm settings:

- **Low/High Alarms** – Enable alarms that are triggered when a device logs data that exceeds a high temperature/humidity value, or that is below a low temperature/humidity value.
- The low alarm value must be less than the high alarm value.
- **Alarm Delay** – Filter out unwanted alarms by selecting a delay time from the dropdown box. For example, when monitoring the temperature of a refrigerator, you might not need to know if the temperature exceeds the alarm level briefly – when someone opens and closes the door, for instance – but you do need to know if someone leaves the door open for more than one minute.

  You can set a separate delay for temperature and humidity alarms.
- **Alarm Hold** – Holds an alarm state even when the temperature/humidity returns to an acceptable range. For example, if the high temperature alarm is set to 42°C and the measured temperature rises to 46°C, an alarm is triggered. If the reading then drops down to 41°C when the **Alarm hold** checkbox is selected, the device retains its alarm status.

  If **Alarm hold** is not selected, the device reverts back to normal status, and the only way to check missed alarms is to review the logged data.
- **Audit Check** – Record an event on the graph by pressing and holding the device button for three seconds to indicate an onsite check of the device.

Complete the following steps to configure WiFi-500 Sensor Series temperature and humidity alarm settings:

1. Select the **On** option button for **Low alarm** to enable a low alarm, and then select a low temperature/humidity alarm value from the list.
2. Select the **On** option button for **High alarm** to enable a high alarm, and then select a high temperature/humidity alarm value from the list.
3. Select the **On** option button for **Alarm hold** to retain the alarm status when the temperature/humidity returns within the alarm range.
4. Select a delay time from the **Delay alarm trigger by** listbox to filter out unwanted alarms.
5. Select the **Enable** option button for **Audit Check** to record an event on the graph when a device is checked onsite (**TEMPERATURE SETTINGS** dialog box only).
6. If you are setting up a device that includes a thermistor probe, select the probe type you are using from the drop-down listbox.

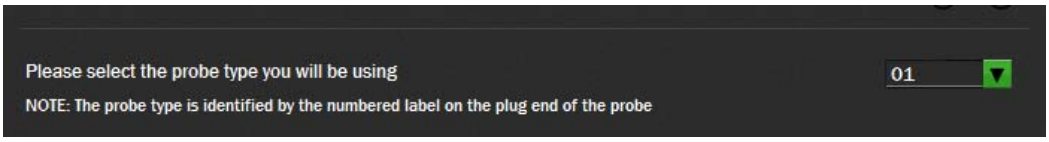



Figure 4: Probe type list

Refer to the label attached to the probe cable for the probe number. Selecting an incorrect probe type causes inaccurate measurements.


Figure 5: Probe type label


Figure 6: TEMPERATURE ALARMS dialog box


Figure 7: HUMIDITY ALARMS dialog box

7. Click **Next** on both the **TEMPERATURE ALARMS** and **HUMIDITY ALARMS** dialog boxes when you finish configuring alarm settings.
8. Click **Next**.
9. Click **Finish** in the dialog box, disconnect the USB cable from the device and place the device in the location you want to monitor.

**Note:** If you receive a Set-Up Failed message, refer to Cannot save device settings using Set-Up Device option on page 38

# Positioning the device

The device signal strength displays on the device LCD. The number 10 indicates a strong signal; the number 1 indicates a weak signal.

Avoid heat, radio emissions, and physical obstructions

Avoid placing a device near sources of heat and radio emission. Also, physical obstructions between the router and device can affect the range of the device. You can use WiFi extenders to improve the range of the device.

The WiFi signal indicator ( ) has three states:

- not displayed – the device has not yet been set-up and configured to a WiFi network
- flashing – not communicating with WiFi Sensor Software
- solid – successful communication with WiFi Sensor Software

# Viewing data on the PC

To view data for a specific logging session on the PC, complete the following steps:

1. Click **View Devices»On This PC** in the main software screen.

   All WiFi-500 Sensor Series devices connected to the WiFi network through the host computer display.

2. Select the device you want to view, and click **View Data** at the bottom of the **Existing devices** screen.


Figure 8: Existing devices screen

By default, all logging sessions for the current month are listed. You can change the date range by using the date buttons.:

- Use the ◀ and ▶ date buttons to scroll through years.
- Use the ▲ and ▼ date sliders to specify a time period within the year containing the session(s) you want to view.

3. Click on the logging session you want to view.


Figure 9: Selecting a logging session

A graph displays with checkboxes to show the following information:

- temperature readings
- relative humidity readings (if supported)
- temperature alarm readings
- relative humidity alarm readings (if supported)
- dew point (if supported)

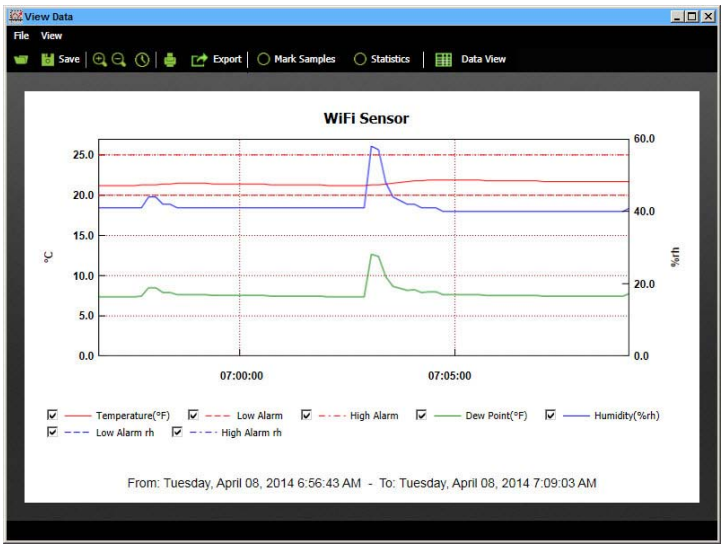
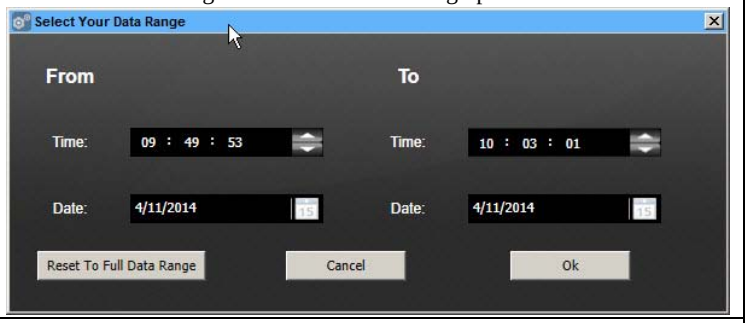
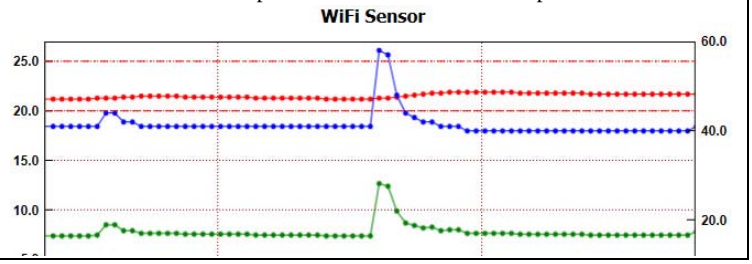



Figure 10: Graph of WiFi-500 sensor data (temperature/humidity example)

# Graph viewing options

The **View** menu and toolbar The graph includes the following viewing options:

| View menu option/toolbar icon | **Function** |
|---|---|
| **View»Toolbar** | Display or hide the toolbar at the top of the graph. |
| **View»Status Bar** | Display or hide the status bar at the bottom of the graph |
| **View»Zoom In** or click on the toolbar | Zoom in to view a narrower range of graph data. |
| **View»Zoom Out or** click on the toolbar | Zoom out to view a wider range of graph data. |
| **View»Data Range** | Enter a time/date range of data to view on the graph.<br>  |
| **View»Gridlines** | Display or hide X-axis and Y-axis gridlines on the graph. |
| **View»Mark Samples** | Adds a small circle to the plot line to indicate each sample.<br>  |

# Creating and viewing data files

You can export logged data and graph images to different file formats, and open them for viewing and analysis.

## Saving all data to a .csv file

Complete the following steps to save all logged data to a text file:

1. Click **Save** on the toolbar.
2. Enter a filename and browse for the location to save the file, and click **Save**.

## Saving a portion of data to a .csv file

Complete the following steps to save a portion of logged data to a text file:

1. Zoom in on the section of the graph containing the data to save (refer to Graph viewing options above).
2. Click **Save** on the toolbar.
3. Enter a filename and browse for the location to save the file, and click **Save**.

### Viewing a text file of logged data

To open a text file of logged data, click **View Saved Data** in the main software screen and browse for the file using the **Locate File** dialog box.


Figure 11: View Data option on main screen

### Exporting data to a file

You can export data or graph images to one of following file formats:

- a comma-separated values (`.csv`) data file for later retrieval and analysis
- a `.jpg` image file of graph
- a `.pdf` of the data or of the graph
- an Excel® file (`.xls`) containing both the data and graph

To export data, click **Export** and select file format from the menu.

## Printing a graph

To print an image of the graph, click  .

## Configuring a device wirelessly from the PC

When you select **View Devices»On This PC** in the main software screen, the **Existing devices** screen displays all WiFi-500 Sensor Series devices that are actively connected to or that are temporarily disconnected from the network through the host computer.

The operations you can perform on each displayed device are explained in the following sections.

### Changing the device arrangement

To change how devices are arranged on the **Existing devices** screen, click the icons in the top right corner of the screen.

 View device images only

 View device images and information

 View device information only

Right-click on a device to move it up, down, to the top of the list, or to the bottom of the list.

You can also arrange all devices by name or by MAC address (the unique number assigned to each device on the network).

### Deleting device readings

To delete the readings currently stored on a device and on the host computer, right-click on a device and select **Delete Readings**.

All readings for the selected device are deleted from device memory and from the host computer.

The device starts logging data again based on its settings.

Data that has been saved or exported to a file *is not* deleted from the file(s).

## Resetting a device out of an alarm state

To reset a device that is currently in an alarm state, right-click the device image and select **Reset Alarm**.

The device returns to a normal, non-alarm state until the next alarm reading occurs.

## Muting the audible alarm

The WiFi Sensor Software includes an audible alarm that sounds when a device is in an alarm state.

Click  to turn alarm muting on and off.

## Displaying device properties

To view the current logging and alarm settings for a selected device, along with the device type, firmware version, MAC address, and the name of the connected WiFi network, click **Properties** in the **Existing devices** screen (refer to Figure 8 on page 13).

You can also right-click the device image and select **Device Properties** from the context menu.


Figure 12: **Device Properties** popup window

## Deleting a device

Complete the following steps to delete a device and all of its data sessions from the software:

1. Select a device in the **Existing devices** screen (refer to Figure 8 on page 13).
2. Right-click the device image and select **Delete Device(s)**.
3. Click **Yes** in the **Are you sure?** dialog box.
4. Click **Yes** in the **Archive Data** dialog box to save device data to the host computer. You are prompted to select a location to save the archived data.

**Caution!** If you are deleting the device in order to update the device firmware, MCC strongly recommends that you archive your data. All data is deleted from a device during a firmware update (refer to Updating firmware on page 37)

Click **No** to skip saving device data and finish deleting the device.

Once you delete a device, perform the Connecting the device to a network procedure on page 8 to reconnect the device to the network and access it through the software.

## Changing device logging settings

To change the logging settings of a device over the network, select the device and click **Change Device Settings** in the **Existing devices** screen (refer to Figure 8 on page 13).

Follow the steps at the beginning of the section Changing device logging settings from the PC on page 10 to change the device logging settings over the WiFi network.

# Storing Device Data on the Cloud

## Completing the Cloud setup

The first time you set up a WiFi-500 Sensor Series device on the Cloud, the only setting you can change is the device name. All others settings are kept at their current values.

Enter a device name and then click **Next**.

1. Disconnect the USB cable from the sensor and click **Next** in the **Set-Up Complete** dialog box.
2. Place the sensor in the location you want to monitor.

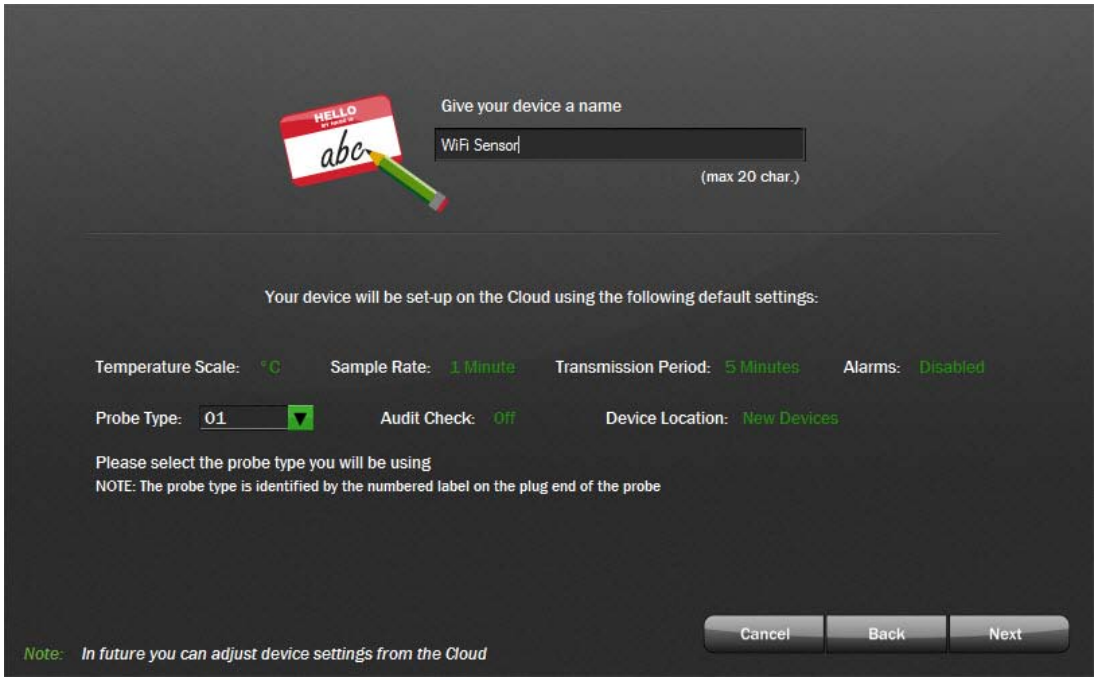



Figure 13: Device settings when Cloud setup complete

## Positioning the device

Avoid placing a device near sources of heat and radio emission. Also, physical obstructions between the router and device can affect the range of the device. You can use WiFi extenders to improve the range of the device.

The device signal strength displays on the device LCD. The number 10 indicates a strong signal; the number 1 indicates a weak signal.

The WiFi signal indicator ( ) has three states:

- not displayed – the device has not yet been set-up and configured to a WiFi network
- flashing – not communicating with WiFi Sensor Software
- solid – successful communication with WiFi Sensor Software

# An overview of the Cloud environment

When you log in to your Cloud account and successfully set up a device through the cloud, you are brought to the Cloud page on the web which has the following main options:

| | |
|---|---|
|  | Depending on your current account type, opens a page with options to upgrade or downgrade to different Free, Personal, and Professional Cloud accounts.<br><br>Refer to www.wifisensorcloud.com/accountdifferences.aspx for a summary of account features. |
|  | Opens a page with links to:<br><br>▪ the **Devices** page<br>▪ the **Cloud Support** page<br>▪ the **My Settings** page (where you can change date/time format for log files, your account email address and password, and control the frequency of Cloud emails)<br>▪ the **Account** page (where you can view account properties and email activity, and change personal information stored in the Cloud account) |
| **Devices**<br><br>(Professional accounts only)<br><br>  <br><br>**My Devices**<br><br>(Free and Personal accounts) | Opens the **My Devices**/**Devices** page which lists all devices set up for the Cloud account. The features on this page are explained in the following sections:<br><br>▪ Displaying device properties on the Cloud<br>▪ Archiving, clearing, and deleting device readings on the Cloud<br>▪ Changing device logging settings from the Cloud<br>▪ Setting up email alerts from the Cloud |
|  | Opens the **Account** page, where you can view account properties and email activity, and change personal information stored in the Cloud account. |
|  | Opens the **Cloud Support** page, which has links to FAQs, and firmware downloads, video tutorials, a technical support request form. |

Only the features on the **Home** and **My Devices**/**Devices** pages are covered in detail in this guide.

Refer to the support resources on the Cloud page for help with the features on other pages.

# Viewing device information

After logging in to your Cloud account, when you select **View Devices»On The Cloud** in the main software screen, the **My Devices** page opens in a browser and displays all WiFi-500 Sensor Series devices on the Cloud. To manage the data received from your device efficiently, the Cloud divides data into sessions. A device begins a session when it begins logging. If changes are made to the device configuration – such as sample rate or alarm level change, the Cloud closes and archives the current session, and creates a new session for the device.

The number of devices you can connect to the Cloud depends on the type of Cloud account you have (Free, Personal, or Professional). Click on the **Upgrade** link for more information on account types and features.


Figure 14: Devices page

The **Devices** page displays the following information about each WiFi device setup for the Cloud.

- **Device** - Displays one of the following icons to indicate the device model:

  T - Temperature-only device (such as a WiFi-501)

  TP - Temperature device with thermistor probe (such as a WiFi-501-TP)

  TH - Temperature/humidity device (such as a WiFi-502)
- **Name** - Displays the name of the device.
- **Signal** - Displays a bar graph indicating the signal strength.
- **Battery** - Displays a bar graph indicating the battery strength.
- **Reading 1** - Displays the latest temperature reading.
- **Reading 2** - Displays the latest humidity reading (if device measures humidity).
- **Status** - Indicates the connection status for active devices. May also indicate **Setup pending** if device settings were changed. When the device receives its new settings the next time it transmits to the Cloud, the *Setup Pending* status is removed.

  Data saved from past sessions have a status of **Archived** along with the archive date.

# Archiving, clearing, and deleting device readings

The **Archive/Delete** icon provides options to archive device data, clear device data, and delete a device and data from the cloud.


Figure 15: Archive/Delete options

- An *archived* device session remains in the device list so all collected data can be accessed, but it is no longer active and logs no new data.
- A *cleared* device remains in the active device list; however, any previously acquired data is deleted.
- A *deleted* device is removed from the device list and all collected data can be deleted and cannot be recovered.

## Archiving data

To archive the readings on an active device on the Cloud, complete the following steps:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen
2. Select the active device in the **Devices** page and click **Archive/Delete**.
3. Click **Archive**.

The data from device is archived on the cloud. The archived data can be retrieved for display and analysis, but this device *session* no longer acquires new data.

The device must be setup for the Cloud again in order to acquire new data. Refer to Setting Up a Device on page 8.

## Clearing data

To clear the readings on an active device on the Cloud, complete the following steps:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen
2. Select the active device in the **Devices** page and click **Archive/Delete**.
3. Click **Clear**.

The data is deleted from the device, and the device continues acquiring data based on its current settings.

### Deleting a device and data

Complete the following steps to delete an active device and its data from the Cloud, complete the following steps:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen.
2. Select the active device in the **Devices** page and click **Archive/Delete**.
3. Click **Delete**.

The device is deleted from the Devices page. The device must be setup for the Cloud again in order to acquire new data. Refer to Setting Up a Device on page 8.

## Displaying device properties

To view the current logging and alarm settings for a selected device over the Cloud, along with the device type, firmware version, MAC address, and the name of the connected WiFi network, complete the following steps:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen.
2. Select the active device in the **Devices** page and click **Properties**.

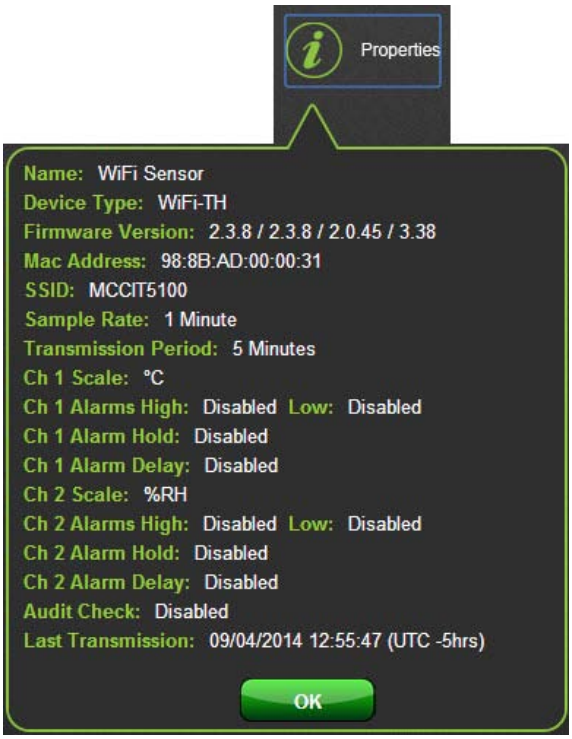



Figure 16: Properties popup on the Cloud

# Changing device logging settings

Complete the following steps to change device logging settings from the Cloud:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen.
2. Select the active device in the **Devices** page and click **Change Settings**.
3. To change the device name, click **Device Name**, enter a name, and then click **Save**.


Figure 17: Device Name setting

4. To change the temperature scale and thermistor probe type (if supported by the device), click **Temperature Scale** (or **Temperature Scale & Probes)**
   - Select **°C - Celsius** or **°F - Fahrenheit**
   - If the device includes a thermistor probe, select the probe type you are using.

     Refer to the label attached to the probe cable for the probe number. Selecting an incorrect probe type causes inaccurate measurements.
   - Click **Save**.

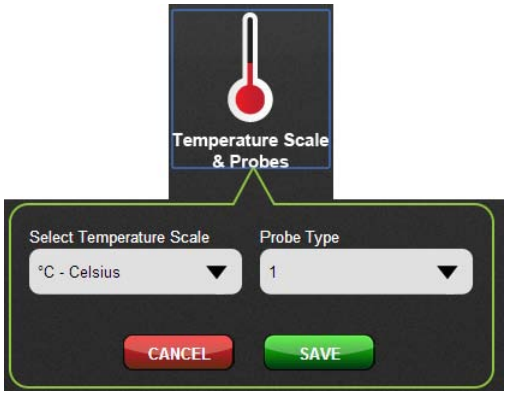



Figure 18: Temperature Scale and Probe Type settings

5. To change the sample rate, click **Sample Rate**, select a sample rate from the list, and click **Save**.

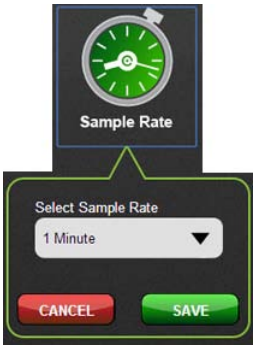



Figure 19: Sample Rate settings

6. To change the transmission period, click **Transmission Period**, select a transmission period from the list, and click **Save**.

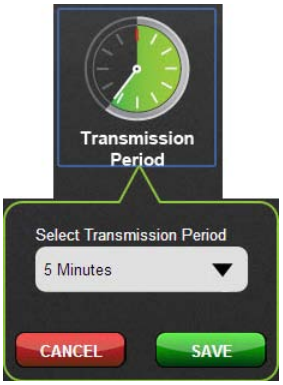



Figure 20: Transmission Period settings

7. To change the temperature/humidity alarms, click **Alarm Settings & Audit Check**, change any of the following settings, and click **Save**.
   - Enable (**On** option) or disable (**Off** option) the low and high alarms for temperature and humidity (if supported).
   - Enter alarm values for each enabled alarm. The low alarm value must be less than the high alarm value.
   - To retain the alarm status when the temperature and/or humidity goes between the alarm range, click the **On** option button for **Alarm Hold**.

     For example, if the high alarm is set to 25 °C and the temperature rises to 26 °C, an alarm is triggered. If the temperature then drops down to 21 °C and **Alarm hold** is selected, the device retains its high alarm status.

     If **Alarm hold** is not selected, the device reverts back to normal status, and the only way to check missed alarms is to review the logged data.
   - To filter out unwanted alarms by delaying the alarm trigger, select a delay time from the **Alarm Delay Alarm Trigger by** listbox.

     To record an event on the graph when a device is physically checked, select the **Enable Audit Check** checkbox. You indicate the device being checked by pressing and holding the device button for three seconds.

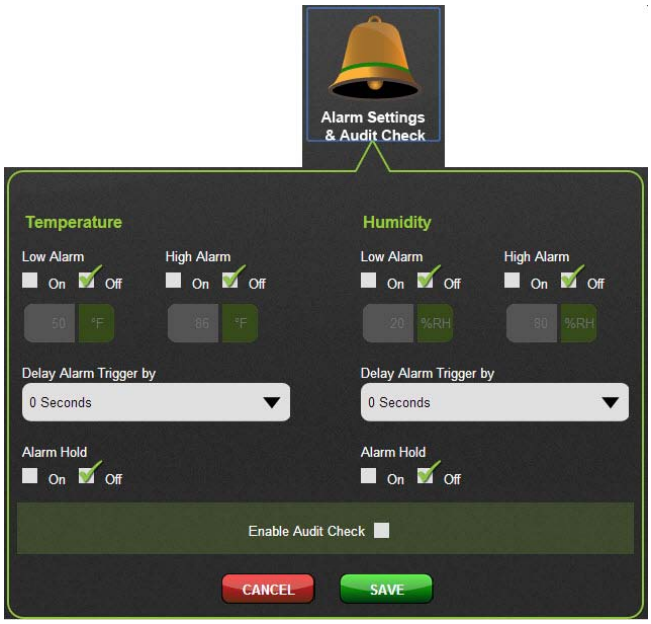



Figure 21: Alarm and Audit Check settings

# Setting up email alerts

You can set up email alerts to notify you and others when alarms are triggered, and also send notification for any of the following events:

- **AC Power** - Reports a change in the state of AC power connected to your device. To monitor power, connect your device permanently using a USB charger and enable the AC Power email alerts. The Cloud sends an email if power fails and when power is restored.
- **Battery Low** - Report when the battery in your device is low and needs re-charging. For uninterrupted data recording, you can recharge at the site of the device using a USB 5V wall adapter or a portable USB battery pack.
- **Loss of Connection** - Reports when regular transmissions from your device are not received. The Cloud sends an email instructing you to check your WiFi network, device position, and battery charge.
- **Device Problems** - Reports when there is a problem with your device, such as a disconnected probe or readings out of range.

Complete the following steps to set up email alert recipients over the Cloud:

1. Click **Email Alerts**.
2. Enter a **Name** and **Email Address** and click .
3. Select the checkbox for each type alert to send to the recipient.
4. Repeat steps 1 through 3 for each email recipient you want to add.
5. Click **Apply** to save all recipients and settings.

## Customizing email alerts

When you set up email alerts, only select those events that you want to generate emails. If you are only interested in the measured alarm levels, deselect some other options you don't need.

When you set-up an alarm level, you can delay the onset of the alarm by a selectable period of time. For example, when monitoring the temperature of a chiller, you might not need to know if the temperature exceeds the alarm level briefly (when someone opens and closes the door, for instance), but you do need to know if someone leaves the door open. When using dual channel device devices, alarm delay is independently settable for each channel.

Have you set an alarm level that is too low or high? Every time a device goes into or out of alarm, an email is sent. If your device is constantly *chattering* around the alarm level, you receive more emails.

To reduce email traffic further, you can choose to reduce the number of alerts, by periodically summarizing them into a single email. You can enable this option, and specify how often the summary emails are sent.

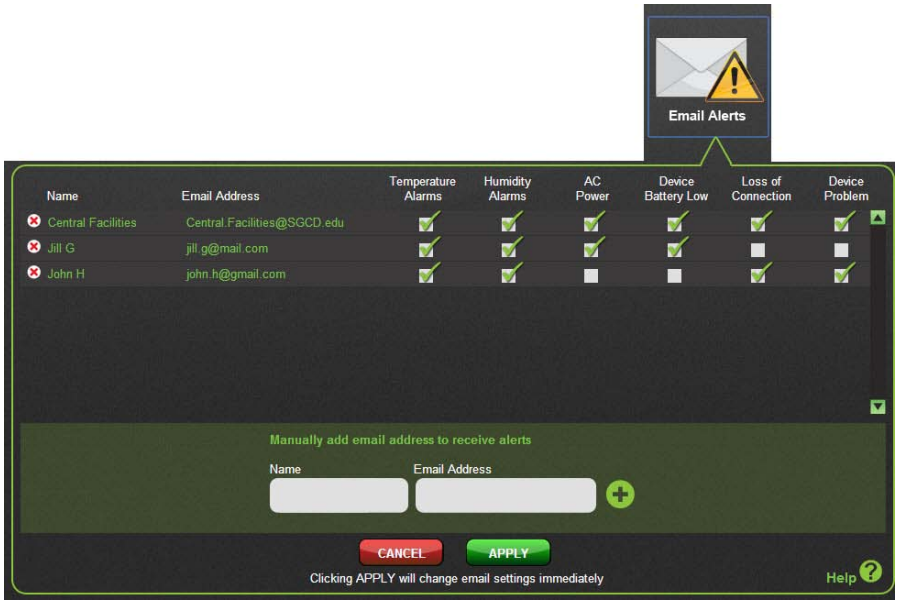



Figure 22: Email Alert settings

## Selecting a device location (Professional Cloud accounts only)

When you first set up a WiFi-500 Sensor Series device on a Professional Cloud account, the device is added to the **NEW DEVICES** location.

Complete the following steps to move a device to another location on the Cloud:

1. Click **Device Location**.
2. Select the location where you to move the device and click **Save**.

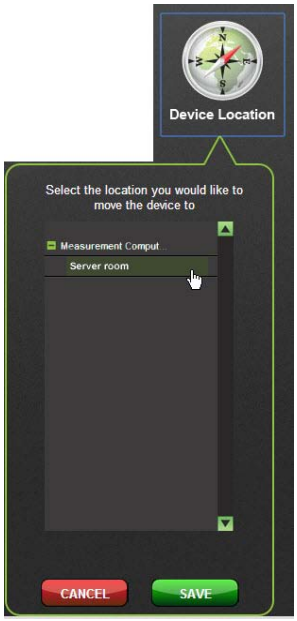



Figure 23: Device Location options

# Viewing graphed data

Complete the following steps to view graphed data for a specific logging session on the Cloud:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen.
2. Select the active device in the **Devices** page and click **View Data**.
3. Click on the **Graph** tab


Figure 24: Data plotted on Sensor Session Data - Graph tab

The **Graph** tab on the **Sensor Session Data** page displays the following information:

- temperature readings
- relative humidity readings (if supported)
- high/low alarm levels (if configured)

## Graph display options

Click **Display Options** to view or hide temperature readings, humidity readings, alarm levels, audit checks, and to mark samples.

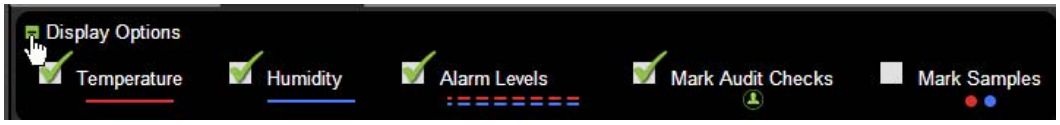



Figure 25: Display Options for Cloud graph

Depending on the time range of the data acquired in the session, you can use the **Zoom** to view graphed data for a selected time period (6 hours, 12 hours, 1 day, 1 week, 1 month, 1 year, or all samples).


Figure 26: Zoom Options for Cloud graph

Click-and-drag the date/time range controls connected to scroll bar to narrow the range of data to a select date and time.

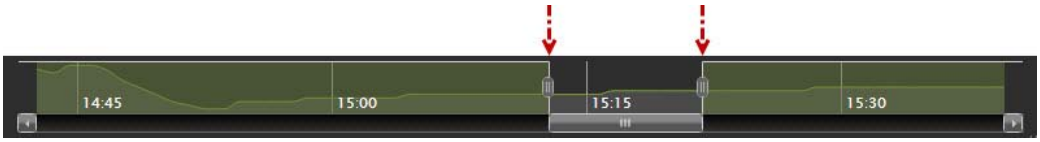



Figure 27: Date/time range controls

## Exporting a graph to PDF (Personal and Professional accounts only)

Personal and Professional Cloud account users can export an image of the graph to a `.pdf` by clicking 

. with the Graph tab displayed.

## Printing a graph (Personal and Professional accounts only)

Personal and Professional Cloud account users can print an image of the graph by clicking 

.

## Viewing sample values

To view the value of each sample from a logging session on the **Sensor Session Data** page, complete the following steps:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen
2. Select the active device in the **Devices** page and click **View Data**.
3. Click on the **Data** tab.

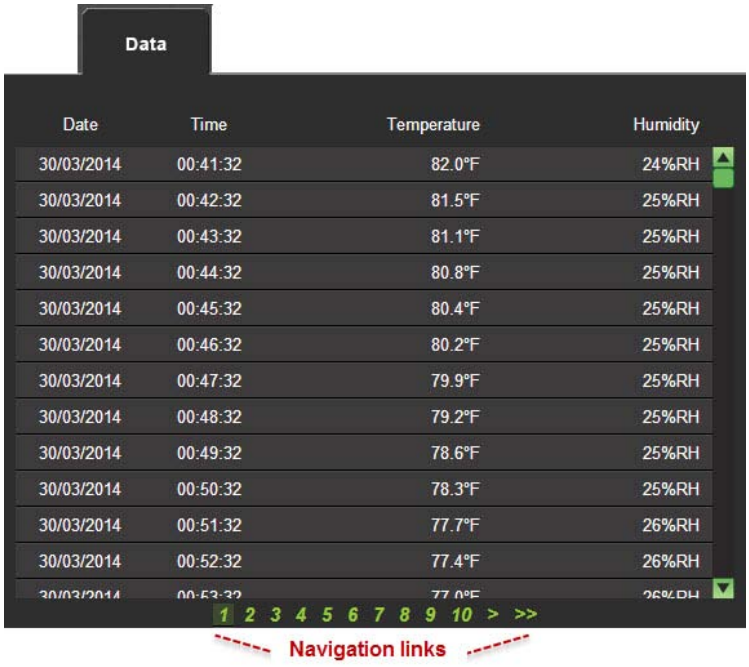



Figure 28: Data listed on Sensor Session Data - Data tab

Each sample is listed on the **Data** tab. Use the green navigation links below the listing to browse through data in the session.

# Exporting data to a comma-separated values (.csv) file (Personal and Professional accounts only)

Personal and Professional Cloud account users can export a logged data to a `.csv` file by clicking 

with the **Data** tab displayed

# Viewing logging session audit information

To view and export audit information on the **Sensor Session Data** page for any logging session for the selected device, complete the following steps:

1. Click the **Other Sessions** tab.
2. Click on the session you want to display.

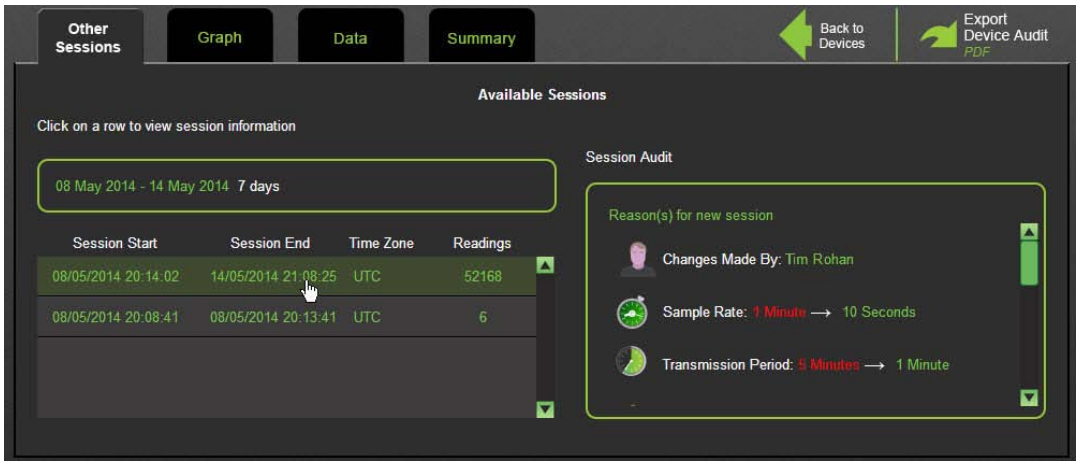


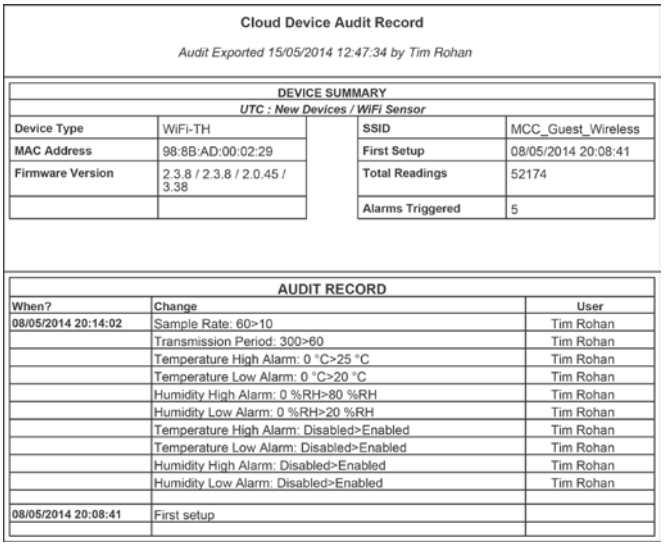

Figure 29: Selecting session on Other Sessions tab

3. Use the scrollbar in the Session Audit frame to view additional session audit information.

# Exporting session audit information to a .pdf file (Professional accounts only)

Professional Cloud account users can export session audit information to a `.pdf` file by clicking 

with the **session** information displayed.



**Cloud Device Audit Record**

*Audit Exported 15/05/2014 12:47:34 by Tim Rohan*

**DEVICE SUMMARY**

*UTC : New Devices / WiFi Sensor*

| | | | |
|---|---|---|---|
| **Device Type** | WiFi-TH | **SSID** | MCC_Guest_Wireless |
| **MAC Address** | 98:8B:AD:00:02:29 | **First Setup** | 08/05/2014 20:08:41 |
| **Firmware Version** | 2.3.8 / 2.3.8 / 2.0.45 / 3.38 | **Total Readings** | 52174 |
| | | **Alarms Triggered** | 5 |

**AUDIT RECORD**

| When? | Change | User |
|---|---|---|
| 08/05/2014 20:14:02 | Sample Rate: 60>10 | Tim Rohan |
| | Transmission Period: 300>60 | Tim Rohan |
| | Temperature High Alarm: 0 °C>25 °C | Tim Rohan |
| | Temperature Low Alarm: 0 °C>20 °C | Tim Rohan |
| | Humidity High Alarm: 0 %RH>80 %RH | Tim Rohan |
| | Humidity Low Alarm: 0 %RH>20 %RH | Tim Rohan |
| | Temperature High Alarm: Disabled>Enabled | Tim Rohan |
| | Temperature Low Alarm: Disabled>Enabled | Tim Rohan |
| | Humidity High Alarm: Disabled>Enabled | Tim Rohan |
| | Humidity Low Alarm: Disabled>Enabled | Tim Rohan |
| | | |
| 08/05/2014 20:08:41 | First setup | |

Figure 30: Session audit export to .pdf

# Viewing a logging session summary

To view a summary of a logging session on the **Sensor Session Data** page, complete the following steps:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen.
2. Select the device session in the **Devices** page and click **View Data**.
3. Click the **Summary** tab.

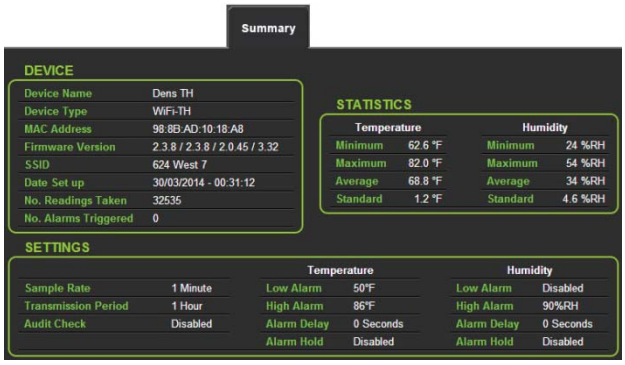



Figure 31: Session summary information on Sensor Session Data - Summary tab

The **Summary** tab displays device information, devices settings, and data statistics (minimum/maximum, average, and standard deviation.

# Viewing, emailing, and deleting event logs

To view a log of device alarm, communication, power and other events, complete the following steps:

1. Log in to your Cloud account and select **View Devices»On The Cloud** in the main software screen.
2. Select the device session in the **Devices** page and click **Event Logs**.

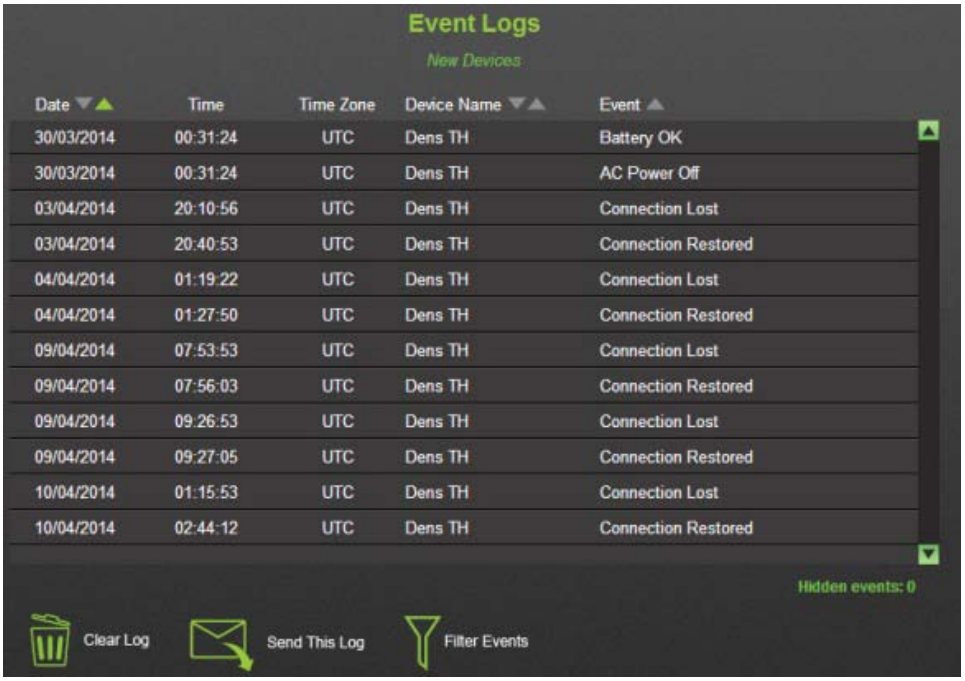



Figure 32: Event Logs page

3. The following event log options are available:
   - Click **Clear Log** to clear all events from the log.

- Click **Send This Log** to send an email to a recipient with the event log attached as a coma-separated values (`.csv`) file. You can enter an email address or, if you have a Professional account, the name of a registered Cloud account user.


Figure 33: Send This Log options

- Click **Filter Event** to select/deselect events that display in the event log.

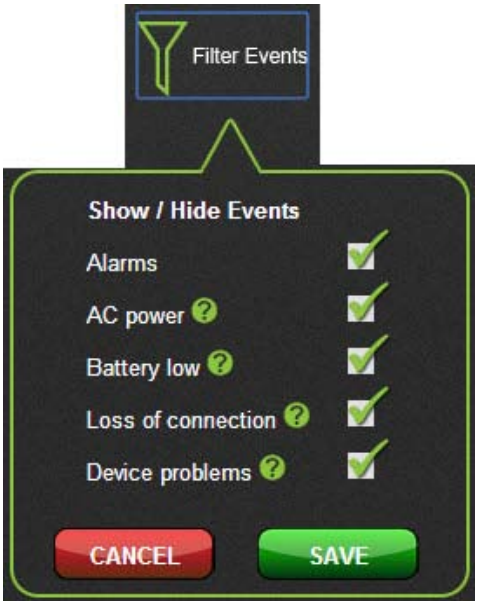



Figure 34: Filter Events options

# Device Operation

## Device components

The different readings and indicators on a typical WiFi-500 Sensor Series data logger are identified in Figure 35.


Figure 35: WiFi-500 device components

| | | | |
|---|---|---|---|
| 1 | Signal strength indicator | 5 | Temperature unit |
| 2 | Alarm indicator | 6 | Device button |
| 3 | Min/Max value indicators | 7 | Humidity reading |
| 4 | Battery charge indicator | 8 | Temperature reading |

Press the screen cycle button to cycle through the different device displays:

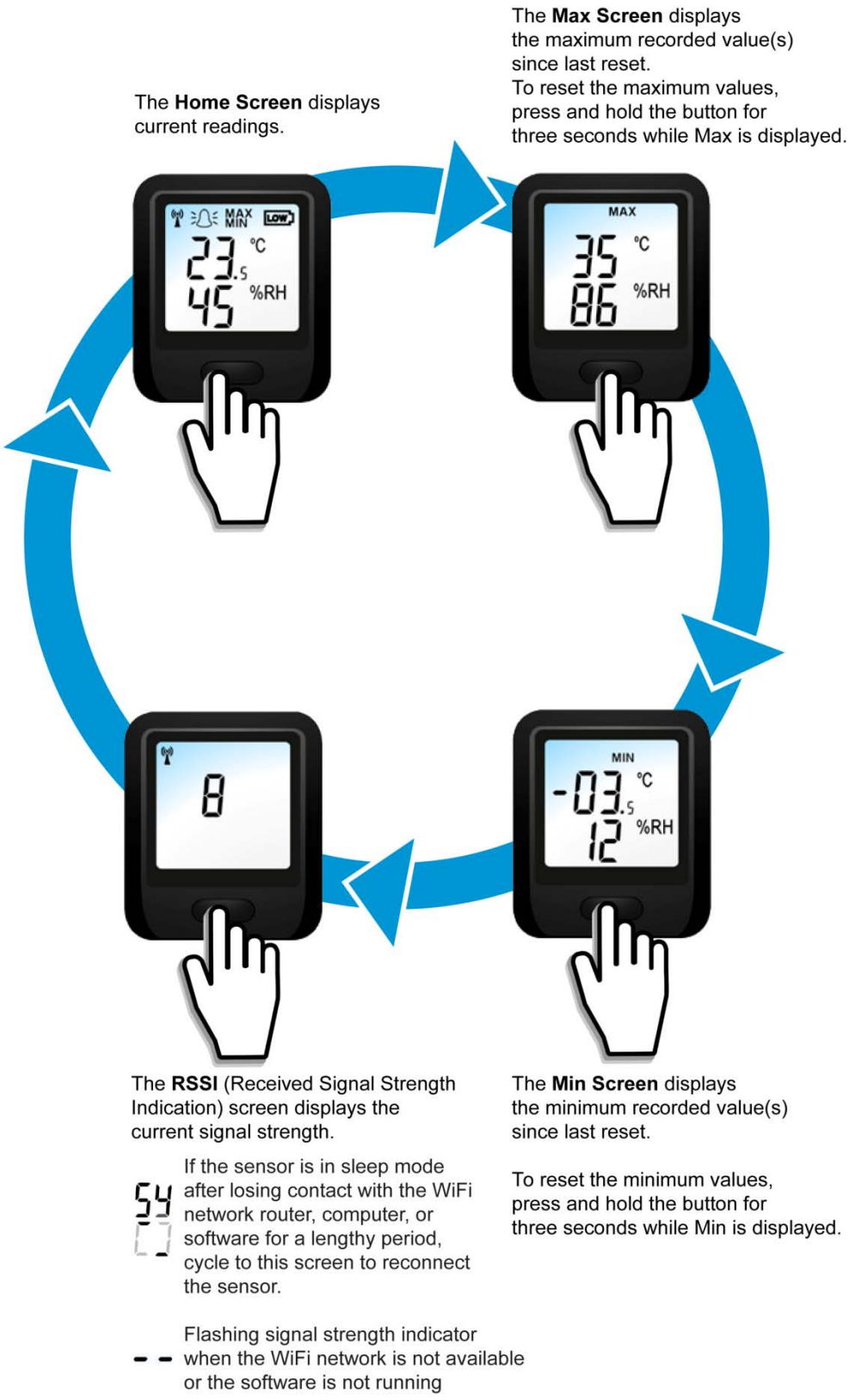



Figure 36: WiFi-500 device display cycle (WiFi-502 example)

# Restarting a device

To restart a device, hold the button for 10 seconds and then release it when LOW flashes in the top right hand corner of the display. The device retains all settings but loses any data that has not been transferred to the computer.

# Resetting a device

To reset a device to its factory settings, hold the button for 20 seconds until FAr5 displays.

Resetting to the factory state deletes all settings and previously recorded data.

# Resetting maximum and minimum values

To reset the maximum and minimum values on a device, cycle through to the maximum or minimum reading display and hold the button for three seconds.

The new minimum or maximum value is the temperature and humidity value read at the time of reset.

# Turning a device off

The device remains on permanently unless the battery runs out.

# Battery and power features

## Recharging the battery

Each WiFi-500 Sensor Series device is shipped partially charged with enough power for the initial set up and use. For optimum performance, use the USB cable provided to connect the device to a PC, a USB + 5V wall adapter, or a portable USB battery pack, and charge the device for 24 hours.

From a very low battery state, it can take up to eight hours to fully charge a device. The battery status can be seen from the **Devices** page on the Cloud.

Many factors affect the battery charge of the device, including:

- transmission period
- WiFi encryption method
- WiFi encryption key rotation frequency (determined by the Access Point or router)
- signal strength between access point or router and device
- the presence, volume, and type of WiFi traffic from other devices
- sample rate
- operating temperature.

In tests, a battery life of over six months was regularly achieved with a transmission period of one hour or more.

The battery charge indicator displays the battery charge status.

| Battery Charge Indicator | Battery Charge Status |
|---|---|
| (not displayed) | Battery charge sufficient |
| LOW (flashing) | Battery charge low – recharge by connecting the device to a computer using the Micro-USB cable provided |
| (solid) | Battery recharging |

If you have a critical process or do not wish to recharge devices, you can keep the USB charger plugged in continuously.

## Optimizing battery performance

To optimize your system to avoid excessive recharging cycles, data loggers include these features:

- Turn off the WiFi Sensor Software when it is not needed. Devices go into sleep mode when the WiFi Sensor Software is not running. No data is lost because it is stored on the device onboard memory, and alarm conditions are still recorded.

  When you restart the software, the device attempts to reconnect within 15 minutes. Once a device reconnects, all stored data is transmitted to the computer.
- The more frequent data is transmitted, the quicker battery power is depleted. By increasing the time between transmissions, the batteries last longer.

The following factors significantly affect the battery life of the device:

- the transmission period
- the WiFi encryption method
- WiFi encryption key rotation frequency (determined by the Access Point or router)
- signal strength between access point or router and device
- volume, and type of WiFi traffic from other devices, sample rate, and operating temperature. In our tests, we regularly achieve battery life in excess of six months with a transmission period of one hour or more.

## Data security if device battery runs out

The device takes no further readings when there is no power, but all readings taken prior to power loss are synchronized. Once the device is recharged, it reconnects to the Cloud and starts a new logging session.

When using battery power, set suitable sample and transmission periods as these affect your battery life. If fast transmission periods and/or long term, uninterrupted logging is needed, power the device with AC power using a suitable USB power supply.

## Data security during a power outage

The device continue recording at the sample rate you have set using battery power, and no data is lost. If a power outage occurs, the device continues to try to connect to your network until power returns and the access point or router becomes available again. The device then synchronizes all remaining data with the Cloud.

## MAX, MIN and battery symbol are all displayed on the LCD at the same time

When these symbols display together, the device is charging, and the temperature of the battery is above 40°C. For safety, the device stops charging until the temperature has returned to a safe level.

## Permanently powering a device

To permanently power a device, use a USB wall adapter or external battery pack.

## Monitoring AC power to a device

You can set up email alerts to notify you when AC power fails or is restored. Connect the device to a AC power source (a USB +5V power supply), and enable email alerts for AC power in **Change Device Settings** page (refer to Setting up email alerts from the Cloud on page 26).

**Caution!** Never connect a device directly to an AC power source – always use the USB cable provided.

**Caution!** Readings can be affected on some types of device while the internal battery is being charged. However once charged, continued connection of the charger or external battery pack has no effect.

# Updating firmware

Complete the following steps to update the firmware on a WiFi-500 Sensor Series device:

1. Delete the WiFi-500 Sensor Series device from the WiFi Sensor Software and then exit the software (refer to Deleting a device on page 18).
2. Connect the device to the host computer.
3. Select **WiFi Sensor Firmware Updater** from the **Start->All Programs->Measurement Computing** menu.
4. Click **OK** on the **WARNING** dialog box.
5. Click the link shown in the **Update WiFi device Firmware** dialog box to download the firmware update file to the host computer.

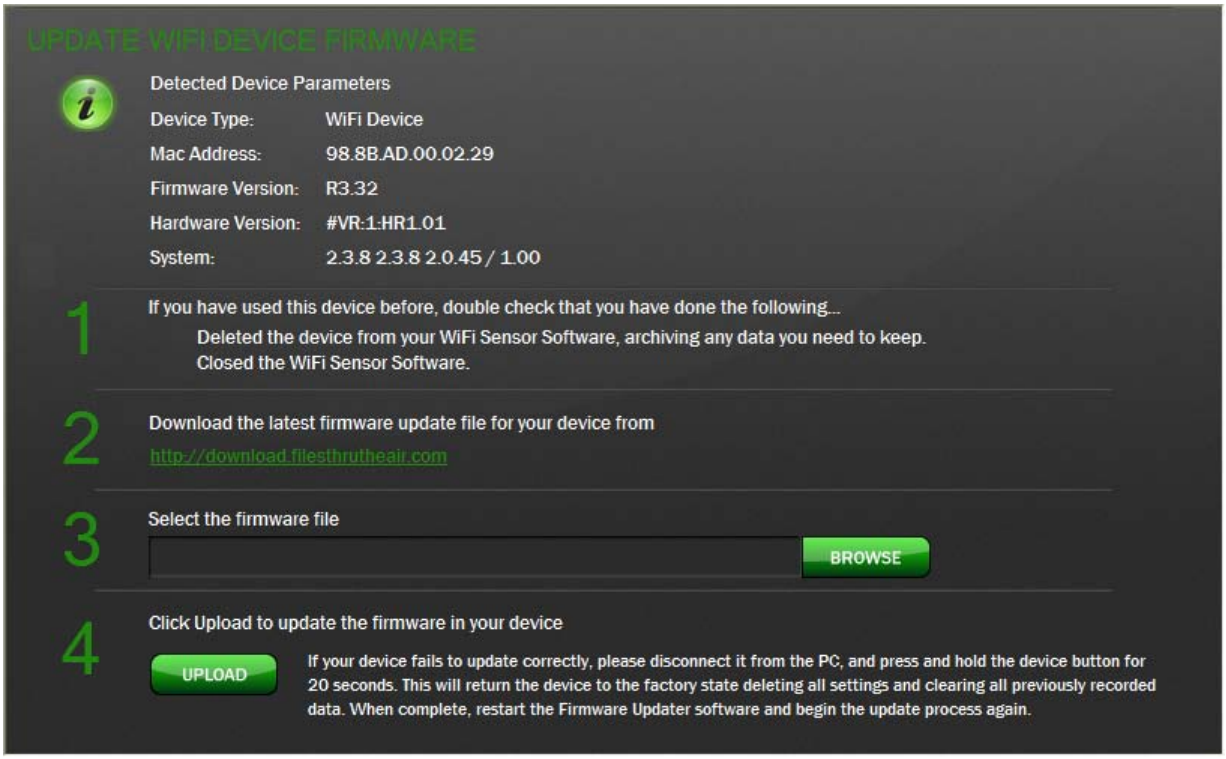



Figure 37: Update WiFi Sensor Firmware dialog box

6. Click **Browse** to select the firmware update file from the host computer.
7. Click **Upload** to update the firmware on the connected WiFi-500 Sensor Series device.
8. Click **OK** on the **Firmware Updated** dialog box.

If the device firmware fails to update correctly, disconnect it from the computer and hold the device button for 20 seconds to delete all data and return the device to its factory settings.

Then, repeat the firmware update procedure from step 2 above.

To benefit from the latest improvements, MCC recommends using the latest firmware releases for your devices. After a firmware update your device is in a factory-reset condition, and needs to be connected to the Cloud using the WiFi-500 Sensor Series. Any existing data for this device on the Cloud is archived for safekeeping.

# Tips and Troubleshooting

## Device/WiFi/Cloud communications

### Software does not detect device connected to PC

If the WiFi Sensor Software does not detect a device physically connected to the PC, try the following steps to resolve the problem

1. Make sure the PC is WiFi-enabled.
2. Disconnect and then reconnect the USB cable.
3. Restart the device by holding the button down for 20 seconds.
4. Restart the software.
5. Reinstall the software to make sure all drivers were installed.

### Cannot connect device to WiFi network

If the WiFi-500 Sensor Series is not connecting to the WiFi network, try the following steps to resolve the problem

1. Check that the password being entered is correct.
2. Click the **Refresh Connections** button. 
3. Check if 802.11b is enabled on the access point or router.
4. Make sure MAC filtering is not switched on in the access point or router. If it is switched on, only known devices can connect to your router.
5. Make sure that your network has an internet connection.
6. Make sure that the device is in range of the router.
7. Make sure that the router has the latest firmware.
8. If the access point or router has WEP Encryption, make sure that the HEX key is being entered rather than the password. You can find the HEX key in the internal settings of your access point or router.

   You can also search the web for resources to help convert your password to a HEX key.
9. Check that DHCP service is running. This allows the device to be allocated an IP Address. Normally, the DHCP service runs in either your router or on a network server. Make sure that the configured DHCP IP address range allows the addition of new devices if not, then extend the range.
10. If your wireless network uses WPA Enterprise, make sure that the correct authentication type is selected from the drop-down box. Only the types listed are supported.
11. If your access point or router has a wireless mode setting, this must be set to *Mixed*, not *Greenfield*.
12. Make sure that the SSID name does not contain spaces.

### Cannot connect device to Cloud

Once you verify that your access point or WiFi router is working, your device may be out of range.

Check the range of the device by pressing the device button three times. A number between 1 and 10 displays, with 1 indicating a weak signal and 10 indicating a strong signal. When the device shows **- -** there is no signal.

### Cannot save device settings using Set-Up Device option

Make sure the WiFi Sensor Software is added to the allowed programs in the Windows Firewall item in Control Panel.

### WiFi network stops working (power loss, and so on)

If your WiFi network fails for any reason, the WiFi-500 Sensor Series device continues logging at the sample rate that you have set. When your WiFi network is restored, the device automatically syncs data to the Cloud. No data is lost.

### WiFi icon on LCD is flashing

If the  icon is flashing, it indicates that that device is not connected to the WiFi network.

- Check your network connections first and then make sure that the device is within range of the access point or WiFi router.
- To save battery power, put the device into sleep mode for up to 30 minutes and then look for a connection again.

No data is lost while the device is temporarily not connected. Once connection is resumed all data will be synchronized with the Cloud.

### Checking WiFi router for 802.11b compatibility

All WiFi routers are 802.11 compatible, and there are currently four types in general use; a, b, g and n.

To find out what type of router you have, refer to your router user manual or contact your Internet Service Provider.

### Communication over a Virtual Private Network (VPN)

Communication is technically possible provided that the VPN can allow the device to access the internet using TCP port 14354.

## Cloud features

### Data security on the Cloud

Data on the Cloud account is very secure. Accounts and data can only be accessed using the email address and password that you entered when signing up to your account. If you have multiple users with access to your account, a user with Administrator privileges can control which data individual users can access.

Data is regularly backed up using industry-standard precautions. However, MCC recommends that you back up your data locally.

### Time-zones on the Cloud

Free and Personal Cloud accounts have a single time-zone which you select when you sign up. All times and dates on the Cloud are shown for your chosen time-zone.

Because Professional accounts can accommodate multiple sites, you can select a different time-zone for each location. When viewing data, event logs or device properties in a Professional account, times and dates are shown as local (at the device location).

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